Nora Harhen

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EDUCATION

University of California, Irvine — 2019-2024
Ph.D., Cognitive Sciences
Concentration: Cognitive Neuroscience
Advisor: Dr. Aaron Bornstein

University of California, Berkeley — 2014-2018
B.A., Cognitive Science (with High Honors)
Concentration: Cognitive Neuroscience
Advisor: Dr. Anne Collins

EXPERIENCE

Hartley Lab, Dr. Catherine Hartley — 2024-present
Postdoctoral Researcher

Neuroplasticity & Development Lab, Dr. Marina Bedny — 2018-2019
Lab Manager

AWARDS

F31 Ruth L. Kirschstein National Research Service Award, NIMH — 2023-2025
Memory, Space, & Time Workshop Travel Award — 2022
Sloan-Nomis Cognitive Foundations of Economic Behavior Summer School — 2022
Reinforcement Learning & Decision-making Conference Travel Award — 2022
National Defense Science & Engineering Graduate Fellowship — 2020-2023
Robert J. Glushko Prize for Outstanding Undergraduate Research — 2018
Summer Undergraduate Research Fellowship — 2017

PUBLICATIONS

(*Equal contribution)

Journal Articles

Harhen, N.C., Bornstein A.M. Interval timing as a computational pathway from early life adversity to affective disorders. *Topics in Cognitive Science* (2024).

Harhen, N.C., Bornstein A.M. Overharvesting in human patch foraging reflects rational structure learning and adaptive planning. *Proceedings of the National Academy of Sciences* (2023).

Arcos, K.*, **Harhen, N.***, Loiotile, R., Bedny, M. Superior verbal but not nonverbal memory in congenital blindness. *Exp Brain Res* (2022). https://doi.org/10.1007/s00221-021-06304-4

Loiotile, R., Kanjlia, S., **Harhen, N.**, Bedny, M. "Visual" cortices of congenitally blind adults are sensitive to response selection demands in a go/no-go task. *Neuroimage* (2021). https://doi.org/10.1016/j.neuroimage.2021.118023.

Refereed Conference Proceedings

Harhen, N.C., Bornstein A.M. Learning to expect change: Volatility during early experience alters reward expectations in a model of interval timing. *Proceedings of the 20th International Conference on Cognitive Modeling* (2022). Selected as one of the best papers of *ICCM*.

Harhen, N.C., Bornstein A.M. Humans adapt their foraging strategies and computations to environment complexity. *Proceedings of the 5th Multidisciplinary Conference on Reinforcement Learning and Decision Making* (2022).

Harhen, N.C., Bornstein A.M. Structure learning as a mechanism of overharvesting. *Proceedings of the 19th International Conference on Cognitive Modeling* (2021).

Harhen, N.C., Hartley, C.A, Bornstein, A.M. Model-based foraging using latent-cause inference. *Proceedings of the 43rd Annual Conference of the Cognitive Science Society* (2021).

CONFERENCE POSTERS & TALKS

Harhen, N.C., Hartley C.A., Bornstein A.M. Developmental differences in exploration reveal differences in structure inference. The Fifth International Convention on the Mathematics Of Neuroscience and AI, Rome, Italy (May 2024). Selected for a spotlight talk.

Harhen, N.C., Bornstein A.M. Temporal representation optimization as a computational link between early life experience and affective disorders. Computational Psychiatry Conference, Dublin, Ireland (July 2023).

Harhen, N.C., Bornstein A.M. Temporal representation optimization as a computational link between early life experience and affective disorders. International Conference on Learning and Memory, Huntington Beach, CA (April 2023). Selected for a symposium talk.

Harhen, N.C., Bornstein A.M.*, Hartley, C.A.* Changes in memory-guided decision-making underlie increased model-based planning across development. Society for Neuroeconomics Annual Meeting, Crystal City, VA (October 2022).

Harhen, N.C., Bornstein A.M.*, Hartley, C.A.* Memory-guided decision-making develops alongside model-based planning. Flux Society Congress, Paris, France (September 2022).

Harhen, N.C., Bornstein A.M. Learning to expect change: Volatility during early experience alters reward expectations in a model of interval timing. International Conference on Cognitive Modeling, Toronto, Canada (July 2022). Selected for a talk.

Harhen, N.C., Bornstein A.M. Temporal representation adaptation as a computational link between early life unpredictability and anhedonia. Computational Psychiatry Course, New York, NY (July 2022).

Harhen, N.C., Bornstein A.M. Humans adapt their foraging strategies and computations to environment complexity. 5th Multidisciplinary Conference on Reinforcement Learning and Decision Making, Providence, RI (June 2022).

Harhen, N.C., Bornstein, A.M. Representation learning and adaptation in human

foraging. Data Blitz, UCI Center for Learning and Memory Spring Conference, Irvine, CA (March 2022). Selected for a talk.

Harhen, N.C., Bornstein, A.M. Unpredictability during the development of interval timing produces asymmetric responses to positive and negative outcomes. Conte Center @ UCI, 9th Annual Symposium, Irvine, CA, (March 2022).

Harhen, N.C., Baram, T.Z., Yassa, M.A., Bornstein, A.M. Formalizing the Relationship Between Early Life Adversity and Addiction Vulnerability: The Role of Memory Sampling. Society for Biological Psychiatry Annual Meeting, Virtual (April 2021).

Harhen, N.C., Baram, T.Z., Yassa, M.A., Bornstein, A.M. Formalizing the Relationship Between Early Life Adversity and Addiction Vulnerability: The Role of Memory Sampling. Data Blitz, Conte Center @ UCI, 8th Annual Symposium, Virtual (March 2021). Selected for a talk.

Harhen, N.C., Hartley, C.A., Bornstein, A.M. Foraging behavior adjusts to multiple scales of context. Society for Neuroeconomics Annual Meeting, Virtual (October 2020). Selected for a talk.

Kanjlia, S., Loiotile, R., **Harhen, N.**, Bedny, M. Sub-specialization of "visual" cortices for multiple higher-cognitive functions in congenital blindness. Cognitive Neuroscience Society Annual Meeting, San Francisco, CA (March 2019).

Harhen, N.C., Collins, A.G.E. Goal-directed behavior leverages reinforcement learning mechanisms. Cognitive Neuroscience Society Annual Meeting, San Francisco, CA (March 2017).

INVITED TALKS

2024 Janelia, Mechanistic Basis of Foraging Conference
2023 University of Birmingham, Lockwood & Apps Labs
2023 MIT & UCL, Affective Brain Lab
2022 NYU, Concepts & Categories (ConCats) Seminar

TEACHING

Psych 111/112 A,B,C: Honors Experimental Psych
Teaching Assistant September 2019 - June 2020

Letters & Science 22: Sense, Sensibility, & Science
Teaching Assistant January 2016 - May 2016

MENTORING

Julia Yin, NYU Training Program in Computational Neuro January 2024 - present
Yvette Ma, Research Assistant September 2023 - present
Brianna Sarcos, Research Assistant June 2020 - June 2021
Romeo Ignacio, Research Assistant March 2021 - June 2021

SERVICE

Application Statement Feedback Program
Editor 2021-

UCI Cognitive Sciences Colloquium Organizing Committee
Student Organizer 2021-2022

Competitive Edge
Peer Mentor 2020

SKILLS

- General programming in Python, MATLAB, and Julia
- Web-based programming in HTML, CSS, and Javascript
- Data analysis in Python and R
- Experimental design
- EEG data analysis using EEGLab
- fMRI data analysis using FSL/FreeSurfer

OTHER TRAINING

Model-based cognitive electrophysiology workshop — 2020
University of Pennsylvania